

WHAT IS CLAIMED IS:

1. A sulfur-curable rubber compound for a tire tread rubber, comprising at least one diene rubber, at least one filler, and at least one plasticizer, wherein the rubber compound comprises 5 to 90 phr of at least one layered silicate modified with alkylammonium ions and free of guest molecules that have been polymerized or swelled in by a prior treatment.
2. The sulfur-curable rubber compound of claim 1, wherein the compound contains 40 to 85 phr of said at least one layered silicate.
3. The sulfur-curable rubber compound of claim 1, wherein the compound contains 50 to 80 phr of said at least one layered silicate.
4. The sulfur-curable rubber compound of claim 1, wherein said alkylammonium ions comprise ions of the general formula $^+NR_4$, wherein the radicals R are the same or different and at least one radical R is an alkyl group.
5. The sulfur-curable rubber compound of claim 4, wherein the radicals R are selected from hydrogen, substituted or unsubstituted, saturated or unsaturated, linear or branched alkyl groups having 1 to 40 carbon atoms and substituted or unsubstituted aryl and benzyl groups, provided that at least one radical R is an alkyl group having at least 9 carbon atoms.
6. The sulfur-curable rubber compound of claim 4, wherein all radicals R represent alkyl groups.

7. The sulfur-curable rubber compound of claim 5, wherein said at least one radical R is an alkyl group having at least 18 carbon atoms.
8. The sulfur-curable rubber compound of claim 6, wherein at least two radicals R are alkyl groups having at least 14 carbon atoms.
9. The sulfur-curable rubber compound of claim 8, wherein said at least two radicals R are alkyl groups having at least 18 carbon atoms.
10. The sulfur-curable rubber compound of claim 5, wherein said alkylammonium ion of the general formula $^+NR_4$ comprises a total of at least 20 carbon atoms.
11. The sulfur-curable rubber compound of claim 10, wherein said alkylammonium ion of the general formula $^+NR_4$ comprises a total of at least 30 carbon atoms.
12. The sulfur-curable rubber compound of claim 5, wherein said alkylammonium ion of the general formula $^+NR_4$ comprises a total of not more than 80 carbon atoms.
13. The sulfur-curable rubber compound of claim 11, wherein said alkylammonium ion of the general formula $^+NR_4$ comprises a total of not more than 60 carbon atoms.

14. The sulfur-curable rubber compound of claim 7, wherein said alkylammonium ion of the general formula $^+NR_4$ comprises at least one methyl group.
15. The sulfur-curable rubber compound of claim 2, wherein said alkylammonium ions comprise dimethyl dioctadecyl ammonium ion.
16. The sulfur-curable rubber compound of claim 1, wherein the modified layered silicate has a carbon content of 5 to 50 percent by weight.
17. The sulfur-curable rubber compound of claim 1, wherein the layered silicate comprises individual layers having a thickness ranging from 0.8 to 2.0 nm.
18. The sulfur-curable rubber compound of claim 17, wherein the individual layers have a mean diameter ranging from 80 to 800 nm.
19. The sulfur-curable rubber compound of claim 1, wherein the at least one diene rubber is selected from natural rubber, synthetic polyisoprene, polybutadiene, styrene-butadiene copolymer and combinations thereof.
20. The sulfur-curable rubber compound of claim 6, wherein the at least one diene rubber comprises cis-1,4-polyisoprene having a 1,4-cis content of more than 90 %.
21. The sulfur-curable rubber compound of claim 19, wherein the at least one plasticizer comprises at least one processing oil.

22. The sulfur-curable rubber compound of claim 21, wherein the processing oil is present in amounts ranging from 2 to 50 phr.
23. The sulfur-curable rubber compound of claim 1, wherein the rubber compound further comprises up to 85 phr carbon black, with the total amount of carbon black and layered silicate not exceeding 90 phr.
24. The sulfur-curable rubber compound of claim 23, wherein the amount of carbon black is 5 to 50 phr.
25. The sulfur-curable rubber compound of claim 2, wherein the rubber compound further contains at least one silane coupling agent.
26. The sulfur-curable rubber compound of claim 25, wherein the at least one silane coupling agent comprises a bifunctional organosilane having at least one group selected from alkoxy, cycloalkoxy and phenoxy.
27. The sulfur-curable rubber compound of claim 1, wherein said alkylammonium ions comprise dimethyl dioctadecyl ammonium ion, the modified layered silicate has a carbon content of 5 to 50 percent by weight, the layered silicate comprises individual layers having a thickness ranging from 0.8 to 2.0 nm and a mean diameter ranging from 80 to 800 nm, the at least one diene rubber comprises cis-1,4-polyisoprene having a 1,4-cis content of more than 90 %, the at least one plasticizer comprises at least one processing oil in amounts ranging from 2 to 50 phr, and wherein the rubber compound further comprises at least one silane coupling agent.

28. A method of making a tire tread rubber, comprising preparing a rubber compound by mixing at least one diene rubber, at least one plasticizer and other conventional components for tire tread rubbers with 5 to 90 phr of at least one layered silicate modified with alkylammonium ions and free of guest molecules that have been polymerized or swelled in by a prior treatment, forming said compound into a tire tread rubber and curing said compound in the presence of a sulfur vulcanizing agent.
29. A vehicle tire having a tread rubber, the tread rubber being made, at least in part, from a sulfur-curable rubber compound comprising at least one diene rubber, at least one filler and at least one plasticizer, wherein the rubber compound comprises 5 to 90 phr of at least one layered silicate modified with alkylammonium ions and free of guest molecules that have been polymerized or swelled in by a prior treatment.
30. The vehicle tire of claim 29, which is a racing tire.